REMARKS

In the Office Action dated March 15, 2007, the Examiner noted that the term "30" in claim 3 should be "3D", and this correction has been made. The Examiner also noted that the phrase "series of 2D projections" should have been deleted from claim 3, as was already done in claims 4, 9 and 10. This correction has also been made in claim 3.

Claims 1-5 and 7-11 were rejected under 35 U.S.C. §102(b) as being anticipated by Alexandrescu. Claims 6 and 12 were rejected under 35 U.S.C. §103(a) as being unpatentable over Alexandrescu in view of Collins.

These rejections are respectfully traversed for the following reasons.

As argued in Applicant's previous response, the subject matter disclosed and claimed in the present application makes use of the movement of the carrier support (i.e. the C-arm) on which the x-ray source and the radiation detector are mounted, that occurs anyway for the purpose of obtaining a series of 2D x-ray projections of an examination subject, to also acquire a 3D image data set by the movement of the carrier support also causing movement of a light line over the surface of the examination subject. The light line is emitted from a light source that is a component of an optical 3D sensor that is mounted on the carrier support. The optical 3D sensor also includes a light detector, that detects the aforementioned light line on the surface of the examination subject, that is also mounted on the carrier support.

Since it is necessary for the light line to move over the surface of the examination subject in order to acquire the aforementioned 3D data set that conforms to the surface of the examination subject, it is normally necessary to provide some type of extra mechanism in order to move the light source or movingly

deflect the light beam, in order to accomplish the aforementioned optical scanning of the surface of the examination subject. The present inventor has had the insight to realize that since the carrier support is being moved anyway for the purpose of acquiring the series of 2D x-ray projections, this movement can also be used to move the light line, by mounting both the light source and the optical detector of the optical 3D sensor on the carrier support. Since both the light source and the optical detector are mounted on the carrier support, even though the carrier support is moving, the light line will always be in the field of view of the optical detector, and no special measures have to be taken in order to keep the light line in the field of view of the optical detector.

As also argued in Applicant's previous response, the object identifying apparatus disclosed in the Alexandrescu reference is not for the purpose of acquiring a 3D data set that represents the *surface* of an examination subject, but is instead for the purpose of identifying 3D *positions* of various objects in an examination room. It is true that the object identifying apparatus disclosed in the Alexandrescu reference includes the examination subject as one of these objects, since collision-avoidance with the examination subject is one of the goals of the Alexandrescu system. Nevertheless, for this purpose the Alexandrescu reference discloses only identifying respective three-dimensional *positions* of the various objects in the room, including the examination subject, but makes no mention whatsoever of identifying any type of 3D data set that represents the *surface* of any of those objects, much less the surface of the examination subject.

As also noted in Applicant's previous response, the only embodiment disclosed in Alexandrescu in which the object identifying apparatus is located on the

C-arm is the embodiment shown in Figure 5 of the Alexandrescu reference. Applicant does not find any disclosure whatsoever in the Alexandrescu reference, however, that the object identifying apparatus is used to generate a 3D data set that conforms to the *surface* of the examination subject in the manner described in independent claims 1 and 7 of the present application. Moreover, Applicant does not find any disclosure in the Alexandrescu reference that movement of the C-arm is used to move the light beam that is emitted by the object identifying apparatus while the x-ray system is acquiring 2D projections using the same movement of the C-arm, as set forth in independent claims 1 and 7 of the present application. Moreover, there is no optical detector or the C-arm in the Alexandrescu system.

In response to these arguments that were made in Applicant's previous response, the Examiner in the March 15, 2007 Office Action cited column 3, lines 33-36 and lines 51-60 of Alexandrescu as providing a teaching, according to the Examiner, that the optical 3D sensor in Alexandrescu is performing the acquisition of a 3D image data set while the C-arm is moving. Applicant respectfully disagrees with this statement of the Examiner on at least two points.

First, the Examiner throughout the Office Action always refers simply to a "3D image data set," whereas the language in claims 1 and 7 explicitly states that this 3D image data set conforms to at least a portion of the surface of the examination subject. As noted above, Applicant does not find any disclosure in the Alexandrescu reference that the 3D information that is contained in the 3D data set represents anything but *positions* of objects in the examination room. There is no disclosure in the Alexandrescu reference that any 3D image representing a *surface* of any of those objects is obtained.

The second point of disagreement on the part of the present Applicant with the Examiner's conclusion is that the passages in Alexandrescu cited by the Examiner make no mention whatsoever of any simultaneous movement of the C-arm and the light beam in the object-identifying apparatus that is mounted thereto. As indicated in Figures 3 and 4, the movement of the light beam occurs by rotating deflection mirrors, and this is essential to the intended operation of the object identifying apparatus disclosed in Alexandrescu. As is explained in detail in the passage in column 3, lines 36-61 of Alexandrescu, it is important to obtain a first two-dimensional light fan 15 that is in a first plane, for example in a vertical direction, as well as to obtain a light fan in a second plane that is aligned approximately perpendicularly relative to the first direction, for example in the horizontal direction. For this purpose, as explained in the preceding paragraph at column 3, lines 30-35, the aforementioned 3D *positions* of the object of the room are acquired given a *known optical base 16* between the light transmitter 12 and the camera 13. If the aforementioned light beams were being emitted while the C-arm was moving in the Alexandrescu system, this known relation would not exist, since the camera 13, and all of the embodiments, is not mounted on the C-arm, but is mounted at a fixed position in the room.

Therefore, Applicant submits that not only does the Alexandrescu reference not disclose obtaining a 3D image data set conforming to a *surface* of the examination subject, but also the Alexandrescu reference does not disclose making use of the movement of the C-arm, that occurs anyway for the purpose of acquiring x-ray images, to also move the light beam from an optical 3D sensor. Both of these features are explicitly set forth in amended independent claims 1 and 7, and

therefore Applicant submits that the Alexandrescu reference does not constitute an anticipation of either of claims 1 or 7, or any of the claims depending therefrom.

As to the rejection under 35 U.S.C. §103(a) based on Alexandrescu and Collins, Applicant acknowledges that the Collins reference discloses generating and combining an x-ray volume data set with a 3D image data set of the surface of a subject. As noted above, however, the Alexandrescu reference does not disclose generating a 3D image data set that represents a surface of the examination, but instead generates a three-dimensional indication of the respective *positions* of objects in the examination room. There would be no purpose to be served by combining a 3D image data set representing *positions* of objects in a room with the 3D volume data set of the examination subject, as set forth in claims 6 and 12. The teachings of the Collins reference presuppose that a "true" 3D image data set representing the surface of the examination subject has been generated and is available, but this is not the case in the context of the Alexandrescu reference. Applicant therefore respectfully submits the teachings of the Collins reference are incompatible with the teachings of the Alexandrescu reference.

All claims of the application are therefore submitted to be in condition for allowance, and early reconsideration of the application is respectfully requested.

Submitted by,

Stan H. Noll (Reg. 28,982)

SCHIFF, HARDIN LLP
CUSTOMER NO. 26574
Patent Department
6600 Sears Tower
233 South Wacker Drive
Chicago, Illinois 60606
Telephone: 312/258-5790
Attorneys for Applicant.